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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl-Heinz Ellenberger et al.
Serial No:
Filing Date:
Title: APPARATUS FOR SORTING LAUNDRY PIECES

J. 829
09/595136
U.S. PTO
06/16/00

June 10, 2000

Docket No.: Mlr206

TRANSMITTAL LETTER

BOX PATENT APPLICATION

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

SIR:

Transmitted herewith for filing is:

- <X> Patent Application (33 pages of specification and claims, 1 page of abstract, 2 drawing sheets)
- <X> Inventor Declaration (German language declaration)
- <X> Certificate of Accuracy of Translation
- <X> Verified Statement - Independent Inventor Declaration
- <X> Verified Statement - Small Business Concern

Basic fee (small entity): \$345.00

TOTAL CLAIMS: 28 - 20 = 8 X \$ 9.00 = \$ 72.00

INDEPENDENT CLAIMS: 3 - 3 = X \$39.00 = \$

<X> Assignment <X> Form PTO-1595 \$ 40.00

<X> Request to Accept Patent Application and to Grand Filing Date

(X) Enclosed is a check to cover the fee in the amount of \$457.00.

(X) The applicant hereby petitions the Commissioner of Patents and Trademarks to extend the time for response to any Office Action outstanding in the above captioned matter as necessary to avoid abandonment of the application. Please charge my deposit account No.11-0224 in the amount required to cover the cost of the extension. Any deficiency or overpayment should be charged or credited to the above account.

(X) The Commissioner is hereby authorized to charge any fees under 35 U.S.C. 1.16, and 1.17, after a mailing of a Notice of Allowance under 35 USC 1.18 or any additional fees which may be required during the entire pendency of the application, or credit any overpayment, to Acct. No.11-0224. A duplicate copy of this sheet is enclosed. If and only if account funds should be insufficient, immediately contact our associate, Lisa Zumwalt, at (703)415-0579, who will pay immediately to avoid deprivation of rights.

() Please charge my Deposit Account No.11-0224 in the amount of \$. A duplicate copy of this sheet is enclosed.

A signature or signatures required for the above recited document(s) is (are) provided herebelow. Such signature(s) also provide(s) ratification for any required signature appearing to be defective in the above recited document(s).

Horst M. Kasper
Horst M. Kasper, 13 Forest Drive, Warren, N.J. 07059
Reg. No. 28,559 Tel.(908)757-2839

Express Mail Certification:

I hereby certify that the correspondence attached hereto is being deposited with the USPS "Express Mail Post Office to Addressee" on the date indicated below and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231,

16 JUN 2000
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl-Heinz Ellenberger et al.

Serial No: Art Unit:

Filing Date:

Title: APPARATUS FOR SORTING LAUNDRY PIECES

December 23, 1999

Mlr206ID

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Sections 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled

APPARATUS FOR SORTING LAUNDRY PIECES

described in

- the specification filed herewith
 application Serial No., filed
 Patent No., issued

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- no such person, concern or organization
 persons, concerns or organizations listed below.*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the

invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: LAVATEC AG

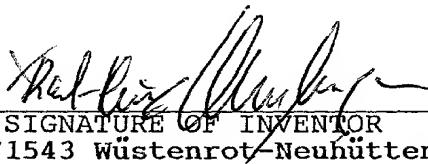
ADDRESS: 74078 Heilbronn, Federal Republic of Germany

< >INDIVIDUAL <X>SMALL BUSINESS CONCERN < >NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Karl-Heinz Ellenberger



X 16.02.2000

NAME OF FIRST INVENTOR

SIGNATURE OF INVENTOR

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Helmut Erb



X 16.02.2000

NAME OF SECOND INVENTOR

SIGNATURE OF INVENTOR

Date

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Indep. Inv. Decl. of Karl-Heinz Ellenbergber et al. Page 2 of 2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl-Heinz Ellenberger et al.

Serial No: Art Unit:

Filing Date:

Title: APPARATUS FOR SORTING LAUNDRY PIECES

December 23, 1999

MLR206SB

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(b)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

- < > the owner of the small business concern identified below;
- < > an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: LAVATEC AG

ADDRESS OF CONCERN: 74078 Heilbronn, Federal Republic of Germany

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that exclusive rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled:

APPARATUS FOR SORTING LAUNDRY PIECES

by inventor(s):

Karl-Heinz Ellenberger
Helmut Erb

described in

- <> the specification filed herewith
<> application Serial No., filed
<> Patent No., issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9 (d) or a nonprofit organization under 37 CFR 1.9(e).

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME
ADDRESS

<>INDIVIDUAL <>SMALL BUSINESS CONCERN <> NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing

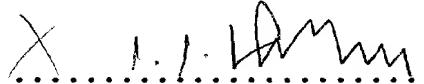
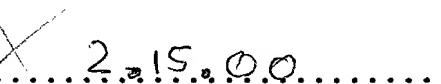
thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Samir A. Tadros

TITLE OF PERSON OTHER THAN OWNER: C.E.O.

ADDRESS OF PERSON SIGNING: LAVATEC AG

Wannenäckerstr.53, 74078 Heilbronn

SIGNATURE  DATE 

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Small Business Concern MLR206SB Dec. 23, 1999 Page 3 of 3

APPLICATION FOR UNITED STATES PATENT

Inventor(s):

Karl-Heinz Ellenberger
Helmut Erb

Invention:

APPARATUS FOR SORTING LAUNDRY
PIECES

Attorney's Docket Number: MLR206

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Attorney's Docket No.: MLR206

SPECIFICATION

APPARATUS FOR SORTING LAUNDRY PIECES

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention concerns and apparatus for sorting of laundry pieces. Such sorting for example is then required when different laundry pieces have to be washed according to different washing programs.

2. Brief Description of the Background of the Invention Including Prior Art

It is known to sort laundry pieces manually. Depending on the respective criteria of sorting, the concerned laundry pieces are individually thrown into a corresponding plurality of laundry containers. This sorting method can be slightly enhanced by predisposing a suction tube to the individual collection containers. The operator then only has to throw the laundry in the region of the suction opening of that tube, which leads to the in each case desired collection container. The throw speed and the hit accuracy can be increased thereby.

It is further known to throw laundry pieces through a frame. Such a frame however is less suitable for sorting and more suitable for counting of the individual laundry pieces, which are to be washed.

SUMMARY OF THE INVENTION

1. Purposes of the Invention

It is an object of the present invention to furnish an improved possibility of a sorting of laundry pieces.

These and other objects and advantages of the present invention will become evident from the description which follows.

2. Brief Description of the Invention

The present invention employs a recognition device known in principle in the state-of-the-art. In connection with such recognizing devices, the items to be identified in each case are furnished with a coding prior to washing. The coding can be read, that means the coding can be recognized. The recognition signal is compared in a data processing plant with a stored reference signal, such that different objects depending on the code applied in each case to the

object can be automatically recognized.

The code is applied to the laundry prior to sorting according to the sorting device of the present invention. As a rule this is performed by furnishing laundry pieces for example with a thread containing a coding, a thread piece or other textile or nontextile band. Then the coding present on the thread, the thread piece, or the other coding carrier present at the laundry piece is read by the recognition device and the read recognition signal is compared with a stored reference value. Depending on the in each case recognized special laundry piece, this special laundry piece is then fed to a predetermined collection device. The laundry pieces to be washed are here individually fed to the recognition device, individualized recognized by the recognition device and then a respective laundry piece is fed to the collection device coordinated to the laundry piece.

The transport device for transfer of laundry pieces from the recognition device to the collection device can advantageously be furnished with a transport band. The collection device can then be disposed easily surveyable in transport direction along the transport belt. The individual collection devices allow also to be moved away

without problem, brought in position or, respectively exchanged from their so to speak aligned positions next to the transport band.

A blow method has proved to be particularly advantageous for the collection or, respectively, transfer of the laundry pieces from the transport device as for example the transport band into the individual containers. The said individual laundry pieces resting on the transport belt can be blown off the transport belt by correspondingly disposed blowing nozzles such that the laundry pieces fall into the collection containers disposed next to the band.

The recognition device delivers its recognition signals to the data processing plant. The data processing plant is connected to the complete control and drive technology, such that the data processing can take into consideration the speed with which the laundry pieces are transported within the transport device for example on the transport band. The data processing plant can therefore know when the laundry piece recognized by the recognition device has arrived at the in each case predetermined collection device. For example, the in each case responsible blowing nozzles can be activated by the data processing plant.

While this controlling of the blowing nozzles and thereby blowing off of the laundry piece of the transport belt for example into the collection container in each case coordinated to this laundry piece is controlled through the speed of the transport belt, the controlling of the blowing nozzles can also be performed by registering devices for example predisposed to the blowing nozzles. The registry devices can be for example light barriers, which registered the arrival of the laundry piece and then deliver a corresponding registration signal to the data processing plant. If the register device is disposed in front of the blowing device, the blow device can be controlled immediately or, respectively with a preceding delay through this register device and then through the data processing plant. If such a registering device is disposed in front of a group of blower devices and thereby in front of a group of collection containers, then the in each case proper blower nozzles can be switched on and thereby activated not in dependence of the registering signal but under consideration of the transport speed.

Possibly a register device is disposed in front of and behind of a blow device. While in the predisposed register device determines the arrival of a laundry piece

and then, when it is the right laundry piece, activates the coordinated blower nozzles, also a register device disposed after leaving the blower nozzles can make sense. It can be determined with a postdisposed registering device, if the laundry piece also in fact, if desired and controlled, was blown off by the blower nozzles.

By employing a sensor device furnished as a light barrier, which runs cross from one side to the other side of the transport belt and thereby also reaches perpendicular through the blower corridor, it can be achieved that the respective light barrier is present simultaneously both in front of as well as behind the blow device. In this manner, the light barrier cannot only signalize the arrival of a laundry piece but beyond that also signalize, if the laundry piece after leaving of the blower corridor still is present on the transport band.

According to an embodiment illustrated also in the drawing, laundry pieces are not fed immediately to the recognition device, but through a predisposed feed device, wherein the feed device is formed as a transport band. An arbitrary large number of feed devices can be disposed above the transport band, wherein the laundry pieces are thrown individually into which feed devices in each case and the

individual laundry pieces are transferred such to the feed device that the laundry pieces exhibit a mutual distance in transport direction, which mutual distance does not fall below a minimum value. The minimum value depends on the processing speed of the recognition device.

The feeding device formed as funnels is associated with the advantage that the laundry pieces falling from the funnel downward do not surpass a pre-given light space profile. The laundry pieces therefore are not disposed on too large an area on the belt. The larger in fact the laundry pieces are present on the belt, the larger the recognition device has to be formed constructively and the more a large area will be required to be worked by the recognition device.

In order to achieve that the laundry pieces can be safely recognized in the recognition direction it has to be assured that the laundry pieces having a mutual distance, which does not fall below a certain predetermined minimum value, and/or having a time interval, which does not fall below a certain predetermined minimum value, are transferred to this recognition device. This can be accomplished by suitable control devices for emptying the funnel. It can be for example provided that flap floors of the funnels present

are only jointly controlled and thereby only jointly opened.

It is furthermore possible to throw the laundry pieces not immediately into the funnels but to predispose a feed band to the funnels. This feed band can exhibit individual compartments, wherein the operating persons lay individual laundry pieces into the individual compartments. In this manner, the individual putting away of laundry pieces, which is performed by hand, can be realized in a simple way and free from interferences and at the same time a uniform feeding of the individual funnels is accomplished.

The novel features which are considered as characteristic for the invention are set forth in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawing, in which are shown several of the various possible embodiments of the present invention:

Fig. 1 is a perspective schematic view of a sorting device according to the invention.

Fig. 2 is a perspective view of a transport band for loading the laundry pieces onto the sorting device according to the invention.

DESCRIPTION OF INVENTION AND PREFERRED EMBODIMENT

In accordance with the present invention, the device 10 illustrated in Fig. 1 for sorting of laundry pieces 12 into individual and different collection containers 14, 16, 18 is furnished with an endless circulating transport band 20. The circulation speed of the endless circulating transport band 20 in the present example is of a constant value.

Two funnels 24, 26 are disposed above the endless circulating transport band 20 in transport direction 22. The laundry pieces 12 are thrown individually and successively into the funnels 24, 26 by for example two operators. Alternatively, the laundry pieces can be delivered by a first transport band 78. The first transport band is disposed at about an angle of 90 degrees relative to the endless circulating transport band 20. The first transport band is furnished with compartments, which aid in

the individualization of laundry pieces and which provide a substantially uniform special distance and point in dropping time distance for the laundry pieces delivered to the endless circulating transport band 20. The compartments 80 have a floor 82 and a rear wall 84 suitable for a horizontal and upward transporting motion. The compartments 80 can be chained by hinge connections 86. The hinge connections can be furnished with a wheel 88 on each end, wherein the wheels 88 are supported by and run on a respective endless support track 90.

The operator generally will through laundry pieces into the compartments 80 of the first transport band 78. Preferably only a single piece of laundry is deposited in an individual compartment 80. If each compartment 80 of the first transport band 78 is filled with a single piece of laundry, an optimum capacity use is accomplished for the first transport band 78 and a maximum number of laundry pieces can be sorted. The speed of the first transport band is adapted to the operational speed of the recognition device 40 and thereby also adapted to the opening speed of the receptacles, that is of the funnels (24, 26). Naturally, a separate transport band of the type of the first transport band 78 would be provided for each one of the two funnels

24, 26.

Each of the funnels 24, 26 is furnished at the bottom with a flap floor 32 comprising two flap parts 28, 30. Two sensors 34, 36 act into the region above the flap floor 32 and thereby above the two flap parts 28, 30, wherein the two sensors 34, 36 comprise two light barriers in the present embodiment. The laundry piece 12 resting on the flap floor 32 is recognized by the two sensors 34, 36 and thereupon the flap floor 32 is opened. During this opening, the two flap parts 28, 30 flap open downwardly such that the laundry piece 12 can fall downwardly onto the transport band 20.

The flap floors 32 can only simultaneously be opened by the two funnels 24, 26 according to the present embodiment. This accomplishes that the laundry pieces 12 put down onto the transport band 20 from the two funnels 24, 26 exhibit a mutual distance in transport direction 22, wherein the mutual distance corresponds to the distance of the two funnels 24, 26 of this transport direction 22.

The laundry pieces 12 put down on the transport band 20 migrate in transport direction 22 into the region of a recognition device 40, wherein the recognition device 40 monitors a region 44 by way of a laser 42 and recognizes

individualizing a laundry piece 12 present in the region 44.

For example laundry pieces may have to be individualized and sorted, which laundry pieces have extremely different sizes. These laundry pieces have to arrive individualized at the region 44 for allowing recognition by the recognition device 40. The individualization is monitored, tested and assured by the sensors 62 and 64 disposed neighboring to the region 44.

Codings are applied at the laundry pieces 12, wherein the codings allow for the laser 42 to recognize the respective laundry piece. For example it is recognized in this way, if the laundry piece is a napkin, a hand towel or a bed sheet. In each case a different coding would be present with these three laundry pieces according to the present example. The coding could contain additionally other features such as for example an identification of the respective customer or other information.

A data signal 46 is sent from the recognition device 40 to a data processing plant 50 connected to the apparatus control of the device 10, wherein the data signal 46 corresponds the read out coding. This data signal 46 is processed in the data processing plant and as a consequence thereof the laundry piece scanned in the region 44 by the

laser 42 is recognized as a napkin or as a hand towel or as a bed sheet.

It is programmed into the data processing plant 50 that for example napkins are to be sorted into the collection container 14, hand towels in the collection container 16, and bed sheets into the collection container 18. Blow nozzles 52, 54, 56 are activated by the data processing plant 50 through corresponding control signals in each case, if the respective laundry piece 12 has arrived in the region 53, 55 or 57 in front of the blow nozzles 52, 54, 56. The transport is performed by way of a transport band 60. The laundry pieces 12 leaving the recognition device 40 fall onto this transport band 60 in the case of the present example.

Sensors 62, 64 are disposed in front of and behind the recognition device 40. The sensors 62, 64, in turn generating again light barriers, recognize on the one hand if a laundry piece 12 moves into the region of the recognition device 40 (sensor 62) and on the other hand (sensor 64), if the laundry piece 12 has also again left the recognition device 40. For example, the recognition device 40 is started only then, when a laundry piece 12 has moved into the region of the sensor 62. For example, the further

transport of this recognized and by the data processing plant 50 registered laundry piece 12 can be controlled by the post disposed and switched sensor 64. Two different laundry pieces 12 are not permitted to be simultaneously present in the region of the recognition device 40. Depending on the present transport speed of the transport band 20, 60 it can then be determined at what time the laundry piece 12 present in the region of the sensor 64 will be disposed in front of the blow nozzles 52, 54, or 56. The sensor 62 and/or 64 deliver a register signal 48 to the data processing plant 50, wherein the register signal 48 contains the presence of a laundry piece 12.

The sensors 62, 64 examine in particular, if a laundry piece is present and if the respective laundry piece, if it is located in the region 44, is not registered by the sensors 62, 64 simultaneously as present. Advantageously, it would be possible to recognize by a time / distance circuit, when a laundry piece leaving the recognition device 40 and/or the region 44, which is recognized by the sensor 64, was transported by the endless circulating transport band 20 and was then transported by the transport band 60 into the region 53, or respectively 55, or respectively 57, from where it was blown into an

associated collection container 14, 16, 18. The blow nozzles 52, 54, or, respectively, 56 can also be controlled through a time / distance circuit.

The blow nozzles 52, 54, 56 can also be activated correspondingly by sensors 66, 68 and 70. The sensors 66, 68, 70 are associated with respective counter sensors on the one hand on the other side transport band 60 and on the other hand diagonally opposite, such that the counter sensors 66.1 or, respectively, 68.1 and 70.1 cover on the one hand the transport band 60 and on the other hand cover the region of the blow nozzles 52, 54 and, respectively, 56. It can therefore be recognized by the corresponding light barriers 67, 69, or 71, when a laundry piece 12 moves into the region 53, 55 or 57 and then the corresponding blow nozzles 52, 54, 56 are activated as long as in each case the right laundry piece is disposed at the proper collection container 14, 16, 18. In addition it can also be recognized by this light barrier 67, 69, 71, if a laundry piece still remained on the transport band 60 after a switching off of the blow nozzles 52, 54, 56. In case the blow nozzles have been activated, then the laundry piece is not permitted to be disposed any longer in the region of the corresponding light barrier.

The control of the blow nozzles 52, 54, 56 is controlled by the data processing plant 50 through control signals 74. The signals come together in the data processing plant 50, wherein the signals are emitted by the individual sensors 32, 36, 62, 64, 66, 68, 70. In addition the data processing plant 50 receives the data signals 46 emitted by the recognition device 40, wherein the data signals 46 enable an identification of the laundry piece in each case to the effect into which collection container 14, 16, 18 the respective laundry piece 12 is to be blown by the blow nozzles 52 or 54 or 56.

Instead of the two funnels 24, 26 there can also be several such funnels be arranged. Instead of the three collection containers 14, 16, 18 there can also still more collection containers be disposed along one or several transport bands 60.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of transport system configurations and piece processing procedures differing from the types described above.

While the invention has been illustrated and described as embodied in the context of a device for sorting

of laundry pieces, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

1. A device for sorting of laundry pieces comprising
a recognition device (40) for recognizing of different types
of laundry pieces (12);
a plurality of collection devices for receiving the
different types of laundry pieces;
a transport device disposed within a reach of the
recognition device and disposed in a delivery relationship
to the plurality of collection devices (14, 16, 18) for
transferring the laundry pieces from the recognition device
(40) to the collection devices (14, 16, 18),
-- with the data processing plant (DVA 50) for processing of
the data signals (46) received from the recognition device
(40), such that predetermined collection devices (14, 16,
18) can be selected depending on the data signals (46) and
can be controlled for receiving laundry pieces coordinated
to the data signals (46), wherein
-- at least one register device (62, 64, 66, 68, 70) is
predisposed to the collection devices (14, 16, 18), for
registering of the laundry pieces (12) disposed in the
transport device (20, 60) and for generating a corresponding
registering signal (48),
-- the register signal (48) can be sent from the registering
device (62, 64, 66, 68, 70) to the data processing plant

(50),

-- the register signal (48) associated with a certain piece of laundry together with the data signal (46) corresponding to the certain piece of laundry is processed in the data processing plant (50) to a control signal (74),

-- the control signal (74) is employable for controlling a predetermined collection device (14, 16, 18) for receiving of the laundry piece corresponding to the control signal.

2. The device according to claim 1 wherein the transport device includes a transport band (60), wherein the collection devices (14, 16, 18) are disposed along the transport band (60) in transport direction (22).

3. The device according to claim 1 wherein in each case a blower device (52, 54, 56) is coordinated to the collection device (14, 16, 18),
wherein the blower device (52, 54, 56) is connected with respect to control to the data processing plant (50),
wherein a control signal (74) delivered by the data processing plant (50) directs the corresponding blower device (52, 54, 56) for generating of a stream of air,
wherein this stream of air is directed against the transport

device (60) in the region of the laundry (12) disposed in the collection device area corresponding to this blower device, such that the laundry (12) can be blown into the collection container (14, 16, 18).

4. The device according to the claim 1 wherein each collection device (14,16, 18) each case is furnished with a registering device (66, 68,70).

5. The device according to claim 4 wherein the registering device (66, 68, 70) is predisposed and preswitched to the collection device (14,16, 18).

6. The device according to claim 4 wherein the register device (66. 1, 68.1, 70.1,) is disposed behind the collection device (14, 16, 18).

7. The device according to claim 4 wherein the register device (66, 66.1, 68, 68.1, 70, 70.1,) is pre-disposed and post disposed to the collection device (14,16, 18).

8. The device according to claim 1 wherein a supply device (20) is present for transporting of the laundry

pieces (12) to the recognition device (40).

9. The device according to claim 1 wherein at least one feed device (24, 26) of the supply device (20) is such predisposed that a predetermined number of laundry pieces (12) with a mutual distance not falling below a predetermined minimum value and/or a not lower time interval is transferable to the supply device (20).

10. The device according to claim 9 wherein the feed device (24,26) includes a first transport band exhibiting at least individual compartments, wherein the contents of the first transport band can be emptied onto a transport band leading to the recognition device (40).

11. The device according to claim 9 wherein the feed device includes at least one funnel (24, 26), wherein the contents of the funnel (24, 26) can be emptied onto a transport band (20) leading to the recognition device (40).

12. The device according to claim 11 wherein the funnel (24,26) is furnished with a flap floor (32), wherein the flap floor (32) can be such flipped open and flipped closed

that the laundry pieces (12) falling out of the funnel (24, 26) can be transferred to the recognition device (40) in each case with a mutual distance not falling below a predetermined minimum measure and/or a time interval not falling below a predetermined minimum measure.

13. The device according to claim 12 wherein the flap floor (32) is formed from several flap parts (28, 30).

14. The device according to claim 12 wherein several such funnels (24, 26) are present and disposed, wherein the flap floors (32) of all funnels (24, 26) can only jointly be flipped open and jointly be flipped closed.

15. The device according to claim 11 wherein the sensor device (34, 36) for recognition of a predetermined number or volume of laundry (12) is present within the funnel (24, 26).

16. The device according to claim 13 wherein a sensor device (34, 36) is present at each flap part (28, 30) for recognition of a predetermined number or volume of laundry (12) on each flap parts (28, 30).

17. A device for sorting of laundry pieces comprising
a transport device for transporting different types of
laundry pieces;
a first collection device for receiving a first type of
laundry pieces and disposed in a receiving relationship to
the transport device;
a second collection device for receiving a second type of
laundry pieces and disposed in a receiving relationship to
the transport device;
a recognition device disposed near the transport device such
that laundry pieces disposed on the transport device are
recognizable for the recognition device, wherein the
recognition device recognizes different types of laundry
pieces, and for transferring the first type of laundry
pieces from the recognition device to the first collection
device and for transferring the second type of laundry
pieces from the recognition device to the second collection
device and for generating a data signal;
a register device predisposed to the first collection device
and to the second collection device for registering of the
laundry pieces disposed in the transport device and for
generating a corresponding register signal;

a data processing plant connected to the recognition device and to the register device and for receiving and then processing the data signals received from the recognition device and for receiving and then processing the register signal received from the registering device, wherein the register signal associated with a certain piece of laundry together with the data signal corresponding to the certain piece of laundry is processed in the data processing plant to a control signal;

control means connected to the data processing plant for receiving the control signal for selecting the first collection device or, respectively, the second recognition device depending on the control signal and for controlling that the first collection device receives first type laundry pieces and that the second collection device receives second type laundry pieces.

18. The device according to claim 17 wherein the transport device includes a transport band; wherein the collection devices are disposed along the transport band in transport direction; wherein the control means includes a first blower device coordinated to the first collection device and a second

blower device coordinated to the second collection device; wherein a control signal delivered by the data processing plant directs the corresponding blower device to generate of a stream of air;

wherein this stream of air is directed against the transport band in the region of the laundry piece disposed in a collection device area of the transport band corresponding to this blower device, such that the laundry piece is blown into the respective collection container;

further comprising

a second registration device associated with the second collection device;

19. The device according to claim 18 wherein the first registering device is predisposed and preswitched to the first collection device;

wherein the second registering device is predisposed and preswitched to the second collection device;

20. The device according to claim 18 wherein the first registering device is disposed following to the first collection device;

wherein the second registering device is disposed following

to the second collection device;

21. The device according to claim 17 wherein the transport device includes a supply device for transporting the laundry pieces to the recognition device); further comprising

a feed device of the supply device **being** such predisposed that a predetermined number of laundry pieces with a mutual distance not falling below a predetermined minimum value and/or a not lower time interval is transferable by the feed device to the supply device;

wherein the feed device includes a first transport band exhibiting at least individual compartments,

wherein the first transport band is disposed such that the contents of the first transport band can be emptied onto a transport band leading to the recognition device;

wherein the feed device includes a funnel, wherein the contents of the funnel is to be emptied onto the transport band leading to the recognition device;

wherein the funnel is furnished with a flap floor, wherein the flap floor is flappable open and flappable closed such that laundry pieces falling out of the funnel are transferred to the recognition device in each case with a

mutual distance not falling below a predetermined minimum measure and/or a time interval not falling below a predetermined minimum measure;
wherein the flap floor is formed from a plurality of flap parts.

22. The device according to claim 21 further comprising a second funnel;

a second flap floor associated with the second funnel, wherein the second flap floors of the second funnel is only jointly flappable open and only jointly flappable closed together with the first flap floor of the first funnel.

further comprising

a first sensor device for recognition of a predetermined number or volume of laundry pieces present within the first funnel;

a second sensor device for recognition of a predetermined number or volume of laundry pieces present within the second funnel;

23. A method for sorting of laundry pieces comprising disposing a transport device within reach of a recognition device and in a delivery relationship to a plurality of

collection devices;
recognizing different types of laundry pieces with the recognition device;
delivering a data signal corresponding to a certain laundry piece from the recognition device to a data processing plant;
processing the data signal received from the recognition device in the data processing plant;
registering the certain laundry piece disposed in the transport device with a register device predisposed to the plurality of collection devices;
generating a corresponding register signal associated with the registration of the laundry piece in the register device;
sending the register signal from the register device to the data processing plant;
processing the register signal associated with the certain piece of laundry together with the data signal corresponding to the certain piece of laundry in the data processing plant to a control signal;
selecting predetermined collection devices in the data processing plant depending on the data signal;
controlling a delivery of the certain laundry piece

coordinated to the data signal to a predetermined one of the plurality of collection devices;

employing the control signal for controlling the predetermined one of the plurality of collection devices for receiving of the certain laundry piece corresponding to the control signal;

transferring the certain laundry piece from the recognition device to the predetermined one of the plurality of collection devices;

receiving the certain laundry piece in the predetermined one of the plurality of collection devices;

24. The method according to claim 23 further comprising
- including a transport band in the transport device;
 - disposing the plurality of collection devices along the transport band in a transport direction;
 - coordinating a blower device to one of the plurality of the collection device;
 - connecting the blower device to the data processing plant for controlling the blower device;
 - furnishing each one of the plurality of collection devices with a register device;
 - delivering a control signal to the data processing plant for

directing the corresponding blower device to generate a stream of air;
directing this stream of air against the transport device in the region of the certain laundry piece disposed in the collection device area corresponding to this blower device;
blowing the certain laundry piece into the predetermined collection container.

25. The method according to claim 23 further comprising predisposing and preswitching the registering device relative to the predetermined collection device.

26. The device according to claim 23 further comprising post disposing and postswitching the register device behind the predetermined collection device.

27. The device according to claim 23 further comprising furnishing a supply device for transporting of laundry pieces to the recognition device;
predisposing a feed device of the supply device such that a predetermined number of laundry pieces with a mutual distance not falling below a predetermined minimum value and/or a not lower time interval is transferable to the

supply device;
furnishing a first transport band exhibiting at least individual compartments to the feed device;
emptying a contents of a first transport band onto a transport band leading to the recognition device;
furnishing at least one funnel to the feed device;
emptying a contents of the funnel onto the transport band leading to the recognition device;
furnishing the funnel with a flap floor;
flipping open and flipping closed the flap floor such that laundry pieces falling out of the funnel are transferred to the recognition device in each case with a mutual distance not falling below a predetermined minimum measure and/or a time interval not falling below a predetermined minimum measure.

28. The device according to claim 23 further comprising employing and disposing several funnels each furnished with a flap floor;
only jointly flipping open and only jointly be flipped closed the flap floors of all funnels;
furnishing a sensor device for recognition of a predetermined number or volume of laundry pieces within each

the funnel;
disposing the sensor device at each flap part for
recognition of a predetermined number or volume of laundry
pieces on each flap part.

ABSTRACT OF THE DISCLOSURE

A device for sorting of laundry pieces comprises a transport device for transporting different types of laundry pieces, a first collection device for receiving a first type of laundry pieces and disposed in a receiving relationship to the transport device, a second collection device for receiving a second type of laundry pieces and disposed in a receiving relationship to the transport device, and a recognition device disposed near the transport device such that laundry pieces disposed on the transport device are recognizable for the recognition device. A register device is predisposed to the first collection device and to the second collection device for registering of the laundry pieces disposed in the transport device and for generating a corresponding register signal. A data processing plant is connected to the recognition device and to the registering device and for receiving and then processing the data signals received from the recognition device and for receiving and then processing the register signal received from the register device.

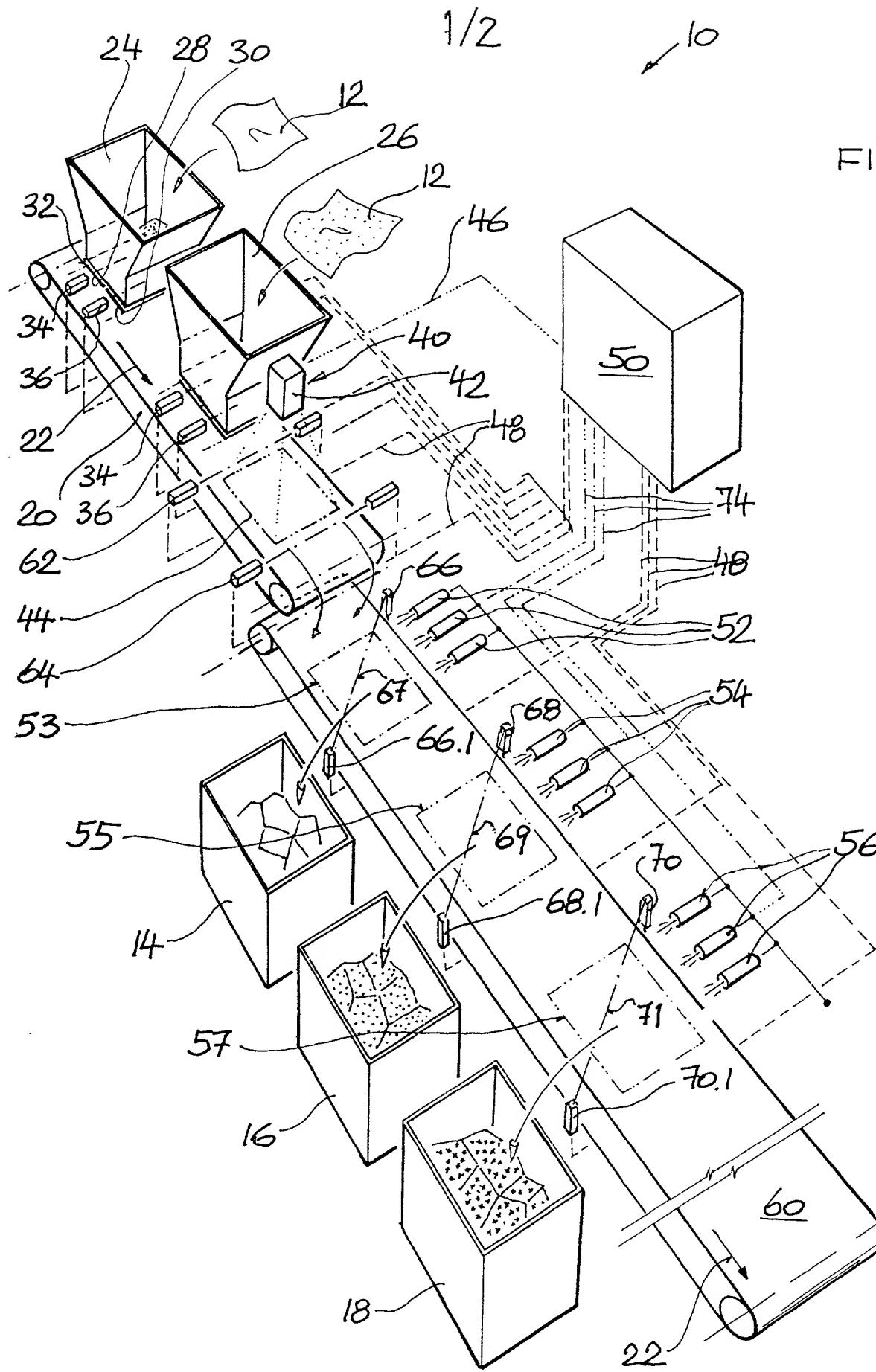


FIG. 1

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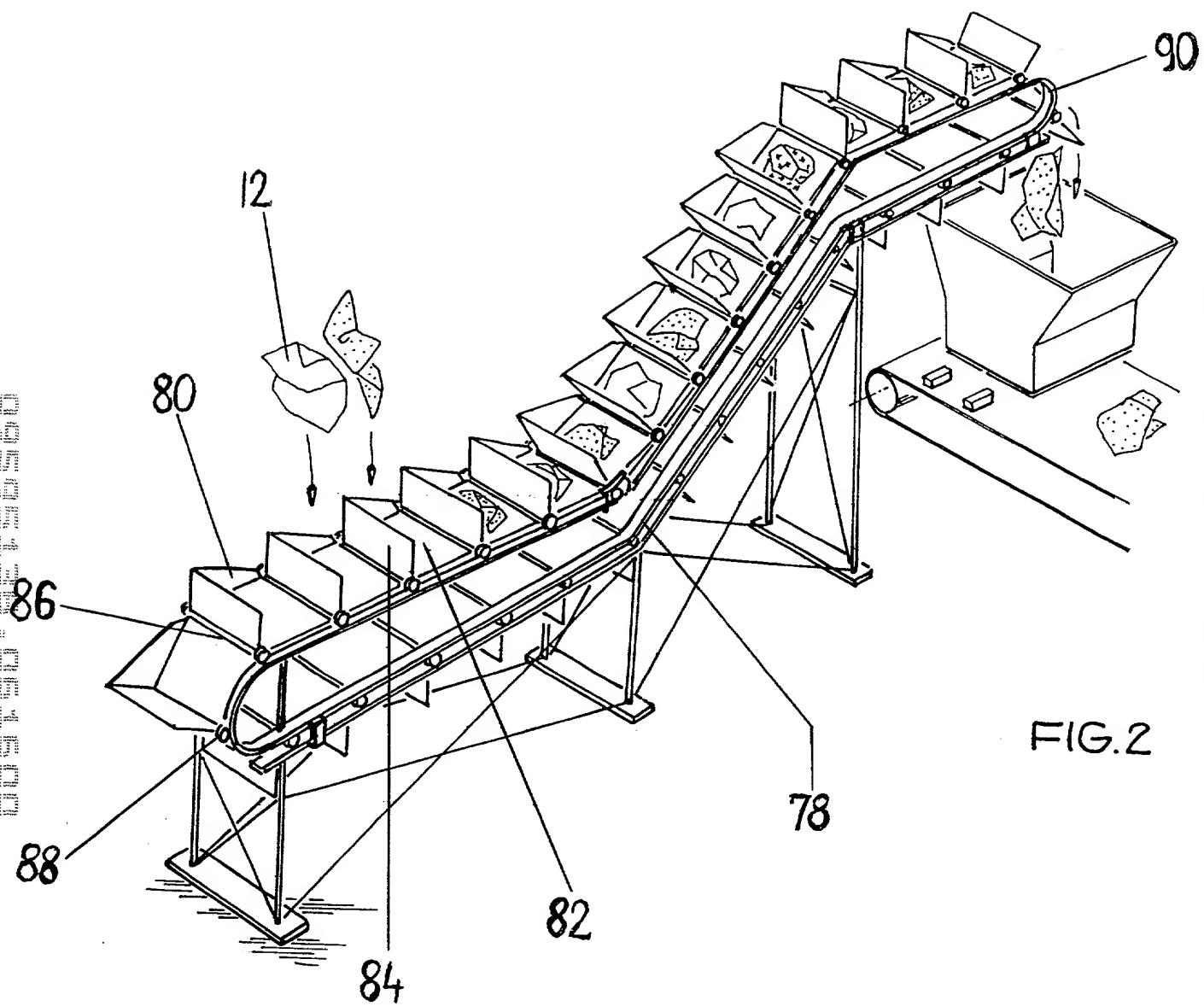


FIG.2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl-Heinz Ellenberger et al.

Serial No: Art Unit:

Filing Date:

Title: APPARATUS FOR SORTING LAUNDRY PIECES

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration Mlr206

Als nachstehend benannter Erfinder erkläre ich hiermit an Eidesstatt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Vorrichtung zum Sortieren von Wäschestücken

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

APPARATUS FOR SORTING LAUNDRY PIECES

deren Beschreibung (nur eines der nachfolgenden Kästchen ankreuzen)

the specification of which (check only one item below)

<X> hier beigefügt ist.
is attached hereto.

< > am als U.S.-Anmeldung, Seriennummer
eingereicht wurde und am abgeändert wurde (falls
tatsächlich abgeändert).

was filed as US Application Serial No. on
and was amended on (if applicable).

< > am als internationale PCT-Anmeldung, Nummer
eingereicht wurde und am unter PCT-
Artikel 36 abgeändert wurde (falls tatsächlich abgeändert).
was filed as PCT international application, Number on
and was amended under PCT Article 36 on
(if applicable)

Ich bestätige hiermit, daß ich den Inhalt der obigen Patentanmeldung einschließlich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Bundesgesetzbuch (Code of Federal Regulation), § 1.56 von Belang sind.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Abschnitt 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 119 jeglicher unten angegebenen Auslandsanmeldung(en) für ein Patent oder Erfindersurkunde oder jeglicher internationalen PCT-Anmeldung(en), welche mindestens ein Land ausser den Vereinigten Staaten benennt, und habe auch jegliche Auslandsanmeldung(en) für ein Patent oder Erfindersurkunde oder jegliche internationale PCT-Anmeldung(en), welche mindestens ein Land ausser den Vereinigten Staaten benennt, nachstehend gekennzeichnet, welche von mir für den gleichen Gegenstand eingereicht wurde und ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT

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**PRIOR FOREIGN /PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER
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**FRÜHERE AUSLÄNDISCHE/PCT ANMELDUNG(EN) UND JEGLICHE PRIORITÄT UNTER
35 USC 119:**

Country (if PCT, indicate PCT)	Application No.	Date of Filing (day, month, year)	Priority Claimed under 35 USC 119
Land (falls PCT, PCT angeben)	Anmeldungsnummer	Anmeldedatum (Tag, Monat, Jahr)	Priorität unter 35 USC 119 beansprucht
DE	299 22 555.0	22-12-1999 (22 December 1999)	< <input checked="" type="checkbox"/> Yes > No Ja Nein

Ich beanspruche hiermit gemäß Absatz 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 120, den Vorzug jeglicher unten aufgeführten U.S.-Anmeldung(en) oder die USA benennende internationale(n) PCT-Anmeldung(en) und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in dieser/diesen früheren Patentanmeldung(en) laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 112 offenbart ist, erkenne ich gemäß Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmelddatum der früheren Anmeldung(en) und dem nationalen oder internationalen PCT Anmelddatum dieser Anmeldung bekannt geworden sind.

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**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING
THE U.S. FOR BENEFIT UNDER 35 USC 120:**

**FRÜHERE AMERIKANISCHE ANMELDUNGEN ODER DIE USA BENENNENDE
INTERNATIONALE PCT-ANMELDUNGEN FÜR VORRECHT UNTER 35 USC 120**

U.S. APPLICATIONS

STATUS (Check one)

U.S. Application No. U.S Filing Date
AMERIKANISCHE ANMELDUNGEN
Seriennummer Anmeldedatum

Patented Pending Abandoned
STAND (ein Kästchen ankreuzen)
Patentiert Anhängig Aufgegeben

< > < > < >

PCT APPLICATIONS DESIGNATING THE U.S.
PCT Application PCT Filing Date U.S.Ser.Nos.
Number assigned (if any)
DIE USA BENENNENDE PCT-ANMELDUNGEN
PCT-Anmelde- PCT-Anmeldedatum Zugeteilte Serien-
nummer nummern (falls zutreffend)

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VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

Horst M. Kasper (Reg. No. 28,559)
Richard T. Laughlin (Reg. No. 17,264)

Telefongespräche bitte richten an: (Name und Telefonnummer)
Direct Telephone Calls to: (Name and telephone number)
Horst M. Kasper, tel. (908) 757-2839

Postanschrift:
Send Correspondence to:
13 Forest Drive, Warren, N.J. 07059

Ich erkläre hiermit, daß alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und daß ich diese eidestattliche Erklärung in Kenntnis dessen abgebe, daß wissentlich und vorsätzlich falsche Angaben gemäß Paragraph 1001, Absatz 18 der Zivilprozeßordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und daß derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

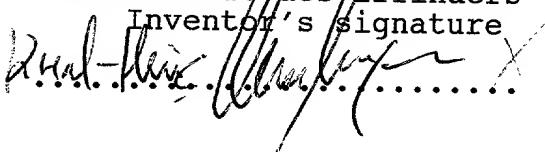
I hereby declare that all statements made herein of my own

knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Voller Name des einzigen oder ursprünglichen Erfinders:
Full name of sole or first inventor:

Karl-Heinz Ellenberger

Unterschrift des Erfinders
Inventor's signature



Datum
Date

16.02.2000

Wohnsitz:

Residence:

Wüstenrot-Neuhütten, Federal Republic of Germany

Staatsangehörigkeit:

Citizenship:

Federal Republic of Germany

Postanschrift:

Post Office Address:

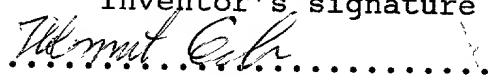
Bärenbronn 20, 71543 Wüstenrot-Neuhütten, Germany

Voller Name des zweiten Miterfinders falls zutreffend:

Full name of second joint inventor if any:

Helmut Erb

Unterschrift des Erfinders
Inventor's signature



Datum
Date

16.02.2000

Wohnsitz:
Residence:
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Staatsangehörigkeit:
Citizenship:
Federal Republic of Germany

Postanschrift:
Post Office Address:
Teutonenstr. 77, 74078 Heilbronn, Germany

PTO 1391 (10-83)
*%pt0:germde(MLR206DE(December 23, 1999(tm

CERTIFICATE OF ACCURACY OF TRANSLATION

The undersigned

WILHELM RÖHRS

at the offices of

Horst M. Kasper
13 Forest Drive
Warren, N.J. 07059

certifies that:

(1) He is fully conversant both with the English and German languages.

(2) He has translated the English language of the attached Combined Declaration for Patent Application and Power of Attorney into the German language.

(3) The translation is, to the best of his knowledge and belief, an accurate translation of the original document into the German language.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the matter with which this translation is used.

Date:

May 8, 2000 Wilhelm H. Röhrs.

WILHELM H. RÖHRS

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl-Heinz Ellenberger et al.
Serial No: Art Unit:
Filing Date:
Title: APPARATUS FOR SORTING LAUNDRY PIECES
Examiner:

June 10, 2000

Docket No.: MLR206

REQUEST TO ACCEPT PATENT APPLICATION AND
TO GRANT FILING DATE

BOX PATENT APPLICATION

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

SIR:

The following inventors:

- (1) **Karl-Heinz Ellenberger**, residing at Bärenbronn 20,
71543 Wüstenrot-Neuhütten, Federal Republic of Germany
- (2) **Helmut Erbr**, residing at Teutonenstr. 77, 74078
Heilbronn, Federal Republic of Germany

wish to submit a patent application with the title

APPARATUS FOR SORTING LAUNDRY PIECES

to be filed for the purpose of receiving a United States Patent.

Applicants are enclosing a stamped self-addressed postcard with a summary relating to this filing. It is respectfully requested that this postcard receive the date-stamp and Serial Number stamp of the United States Patent

and Trademark Office and then be promptly deposited with the United States Postal Service. If such card should not be found in the application papers submitted, then applicants herewith inquire about the status of this application and request that corresponding status information be mailed to the undersigned.

The application includes a specification with pages consecutively numbered and at least one claim.

For purposes of paying the required fee, a check is enclosed. Any fees required in addition are requested to be charged to deposit account # 11-0224. It is petitioned that any time extension which might become required in connection with the filing of this application or in connection with any papers submitted at a later point in time relating to this application be granted.

Respectfully submitted,

Karl-Heinz Ellenberger et al.

By:


Horst M. Kasper, their attorney
13 Forest Drive, Warren, N.J. 07059
Tel: (908) 757-2839 Fax: (908) 668-5262
Reg. No. 28,559 Docket No.: Mlr206

STATUS INQUIRY:

The application is

< > incomplete
< > complete
< > pending

Serial No:..... Filing Date:.....

*%pt1:ap1pet(Mlr206R1(June 10, 2000(tm